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TELEWRITER™

the DRAGON 32 Word Processor

TELEWRITER

Telewriter is the powerful word processor designed specifically for the DRAGON 32 Computer. It can handle almost any serious writing job and is extremely easy to use. It has all the advanced features you need to create, edit, store, format and print any kind of text. With Telewriter you can quickly produce letters, business forms, letters, reports, term papers, articles, technical documentation, stories, novels, screenplays, newsletters. It is also a flexible and efficient way to take notes or organize ideas and plans.

51 x 34 DISPLAY

The DRAGON 32 is an incredibly powerful and versatile computer, but for text editing it has some major drawbacks. The small 52 character by 18 line screen format shows you too little of the text and, combined with its lack of lower case letters, leaves little room for the way text really looks on the page. Reverse video in place of lower case just adds confusion.

Telewriter eliminates these shortcomings with no hardware modifications required. By using software alone, Telewriter creates a new character set that has full lower case letters, and puts 26 lines of 51 characters on the screen. That's more on-screen characters than Apple II, Atari or TRS-80 Model III. That's more than double the DRAGON 32's standard display.

FULL SCREEN EDITOR

The Telewriter editor is designed for maximum ease of use. The commands are single key or single key plus control key L, F, and any no-memorize. There is no need to switch between insert modes and delete modes and cursor movement modes. You simply type. What you type is inserted into the text at the cursor on the screen. What you see on the screen is always the current state of your text. You can move quickly through the text with one key cursor movement in all 4 directions, or press the shift key simultaneously for fast, auto repeat. You can jump to the top or bottom of the text, and beginning or end of a line, move forward or backward a page at a time, or scroll quickly up or down. When you press the end of the line, the screen goes blank so you can move your cursor to the next line.

You can copy, move or delete any size block of text, search repeatedly for any pattern of characters, then instantly delete it or replace it with another. Telewriter gives you a list

The only one with all these features for your DRAGON 32

- 51 column x 26 line screen display
- Sophisticated full-screen editor
- Real lower case characters
- Powerful text formatter
- Works with any printer
- Special MS-DOS driver
- Requires absolutely no hardware modifications
- Tandy colour version also available

key, tells you how much space you have left in memory, and warns you when the buffer is full.

FORMAT FEATURES

When it comes time to print out the finished manuscript, Telewriter lets you specify: left, right, top, and bottom margins, line spacing and lines per page. These parameters can be set before printing so they can be dynamically modified during printing with simple format codes in text.

Telewriter will automatically number 64 pages (if you want) and carry lines. You can chain print any number of text files from source to without user intervention. You can tell it to start a new page anywhere in the text or print at the bottom of the page.

You can print all or any part of the text buffer, about the printing at any point, and there is a "Print after" feature which allows you to type a night to your printer. Because Telewriter lets you copy numeric control codes directly (either from the menu or during printing), it works with any printer (Tandy, Tektronix, MS-80, Okidata, NEC, ROLT, C. Tech 8510, Centronics, GPT, Terminals, Smith Corona TP-1, etc.). There's even a special driver for the Epson MS-80 that lets you simply select any of its 12 fonts and do underlining with a single underline character.

CASSETTE INPUT/OUTPUT

Because the Telewriter makes using cassettes almost painless, you can still have a powerful word processor without the major additional cost of a disk. The advanced cassette handler will search in the forward direction till it finds the first valid file, so there's no need to keep retyping a load command when you are lost in your tape. The Verify command checks your cassette drive to make sure this is good. You can save all or any part of the text buffer to cassette and you can append pre-existing files from those you have in the buffer already.

ASCII COMPATIBLE

Telewriter saves your DRAGON 32 into the most powerful, lowest cost, word processor in the world today. But that's not all. The simple ASCII conversion programs provided with Telewriter means you can use the full power of the Telewriter editor for creating and editing BASIC and assembly language programs. It means you can use Telewriter to prepare an edit and file word with any data communications program.

Telewriter costs \$49.95 on cassette and is

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No Spectrum upgrades

SINCLAIR Research has not yet begun to offer Ram upgrades to convert 16K Spectrums to 64K machines.

Ever since the Spectrum was first advertised in June last year the company has promised the upgrade. "The problem is not how to do the modification," said a Sinclair spokesman, "but how one makes the upgrade available."

"We plan to make the service available in sections of 16K, purchase, fairly and in sequence," he said.

Apparently the upgrade will begin "in a series of a very few weeks," at a cost of £60 which includes parts, labour and all postal charges.

Monopoly no more

PARKER Brothers has lost its battle to keep its US trademark in the Monopoly board game (see Popular Computing Weekly, February 24).

The US Supreme Court last month upheld an earlier California appeal court decision that the word "Monopoly" had become a "commonly descriptive name for real estate board games." The court ruled that Parker Brothers was therefore no longer entitled to the trademark it has held since 1935.

Peanut power

Continued from page 1
of 260 x 192 pixels — colour resolution in this mode is 140 x 192 pixels. Both upper and lower case characters are provided.

The basic Peanut costs £299 plus V.A.T. Other prices (exclusive of V.A.T.) are: disc drive card, £27.95; 250K card, £45.50; Centronics interface, £33.75 and RS232C, £38.25. Language cards and an RS colour card also cost around £40. A disc drive is also available — just under £200.

"The Peanut is priced very realistically," commented Mr Roberts. "If it seems so then one should ask why the Apple is so expensive."

The Peanut Computer will be available from the middle of April by mailorder only from: Peanut Computers, Dowsbury, West Yorkshire.

CTA to investigate lending libraries



CTA chairman Tony Ince (facing left) and secretary Nigel Blackhurst (facing right).

Continued from page 1

to investigate questions of copyright and software lending.

The CTA is to develop a standard warning against unauthorised use of software. A watchdog will monitor the activities of lending libraries.

It was suggested that the CTA might follow this with an action to fight a test case.

Membership of the CTA now includes: Alan, Tandy, Computers, Bug Hyle, Silversoft, Camell, Virgin Games, Oxford Computer Publishing, Lentherton, Microware and

Bufile Micro Shop.

The next meeting, to be held in London on Tuesday, March 29, at 11 am (subject yet to be decided) will consider the draft constitution and the code of practice. Details from Nigel Blackhurst (Tel: 0930 33566).

Build your own micro



A 68010 based computer board is being manufactured by Adaptive (Engineering). All that is needed to turn it into a powerful computer is a keyboard and a tv.

The board includes 64K Ram, its 14K on-board firmware provides Basic, 6809 assembly language and DPA. Hex editor. Keyboard input is standard Ascii — output to a black-and-white television or RGB colour monitor is possible. A colour encoder board, which decodes the colour and upper and lower case for use with an ordinary colour tv, is available as an option.

Interfaces include a 1600 baud cassette port and five 50way buffer ports. These latter can be used to connect discs, parallel or serial I/O ports, up to 2M of additional memory, or a sound board.

The central CPU board will sell for £189. The keyboard is priced at £40, the main adaptor is £10.70 and the colour encoder board (available late April) is £26. The disc interface and operating system — Flux 9 or a file format system (enabling individual disc operating systems to be supported) which can handle up to eight double-sided, double density drives — is £120. Serial and parallel interfaces are scheduled for May.

Memory expansion options include a 64K unit with 250 second processor to run CP/M for 167 or a 128K model for £168 which can be simply expanded (only the chips are required) to 2M.

More details from Adaptive (Engineering), 94 Tenney Hamden Road, Forest Gate, London E7.

Apple fights to ban cheap imitations

APPLE is continuing its campaign to stop the import and sale in the US of what it claims are low-cost Apple II look-alikes — so-called "rotten apples".

The company has persuaded the US International Trade Commission to look into alleged infringements of Apple's patents and copyrights in machines produced in the Far East — Hong Kong, Taiwan and Singapore.

This move follows Apple's earlier, unsuccessful, attempt to take legal action in Taiwan against two companies — Sun-raw Computer Services and Golden Formosa. The actions were dismissed by the Taipei court on a technicality. Apple claimed infringement of copyright in the Apple II ROM.

Apple II "look-alikes" on sale in the US and Europe can be bought for less than half the cost of the original machine.

Price unchanged

TEXAS Instruments' £50 discount voucher scheme for the TI 994A home computer has been so successful that the offer is to be continued indefinitely.

"The major reason the 994A machine was not selling was price," said Michael Lynch, TI (UK)'s managing director.

The TI994A, now sells for between £149.95 and £158.95.

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ORIC Owner Magazine & newsletter	1	£5.00	
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Machine code instructions

Included in this week's *Popular Computing Weekly* (January 29-30), in the *Feed & Poly* column, a question about three Z80 machine code instructions: *ld (nn), ld (nn), ld' (nn), ld' (nn), ld' (nn)*.

The seven 'in' instructions that input into a register, using the 'r' register as the port address, are well documented in the Z80 assembly language manual. They have the side effect of setting the flags to

show the status of the data byte read in — whether it is zero, positive, etc.

The *ld (nn)* instruction is not well documented in the assembly manual (and I believe it is not available in Zilog's own assembler), but the corresponding machine code is in the Z80 hardware manual, so I felt justified in listing it as a standard Z80 instruction. It is part of the specification of the Z80 chip. Its effect is to set the flags in the same way as for the other seven instructions, but then to discard away the data byte itself without saving it anywhere.

The *ld' (nn), ld' (nn)* and *ld' (nn)* instructions derive from the way the Z80 was designed to be upward compatible with the Intel 8080. Both instructions are available, unperforated, on the 8080, and so they had to be available on the Z80 as well. However, the Z80 also includes the non-8080 instructions *ld (nn), ld' (nn), ld' (nn), ld' (nn), ld' (nn), ld' (nn)* and so on, all perforated. It seems that it was easier to include a second, redundant, version of *ld (nn), ld' (nn)* and *ld' (nn), ld' (nn)* in this set.

Steve Vickors

22 Featherbed

Rip Mill

Cambridge

For those of you who don't know, Steve Vickors wrote the Spectrum manual. He also de-

veloped the Jupiter Ace, in conjunction with Richard Atkinson.

The missing link

In my piece on machine-loading the Spectrum — page 27 of your February 2/9 issue — a number has gone missing in the data for the first machine-code routine. Line 50 should read:

```
00 0A7F 205 20 120 120 120 120
00 103 80 8 00 00 00 010 10 201
204 20 into as printed
```

is with an extra 32 after 82 in the second line. Also, less obviously, the mysterious instruction

LD 8080

in the disassembled listing of the second routine should read:

LD 80, 8080

Geoff Wickes

34 Flaming Road

Handsworth

Birmingham B17 8EG

Recording problems solved

I am writing to you to advise you on recording problems with your Dragon 32. I am not a computer expert, but I feel I can resolve your problems. The following information has been derived from Dragon Data, audio experts and by trial and error. Now I have no problems and find the Dragon a beautiful machine to use. So please try the following tips:

- 1) Do not listen to people that say 'get a cheap recorder' — You will almost certainly need a good music recorder with automatic level control in order that your data is not corrupted.
- 2) Volume control is important, so make a note of best setting.
- 3) Ensure recording heads are clean.
- 4) Important: On a new tape insert a pencil into cassette and wind leader tape on until it is just past the recording head. If you record the tape fully before saving, you will try to record the program "Title" on the leader tape. Hence, on loading, the Dragon is unable to find the program as it looks for the program

"Title", but does not find it.

- 5) When recording a second program rewind the tape fully and type in Shift "Title of program", switch on recorder and press enter. The tape will wind on and stop just past the first program — start recording the second program at this point. Do not leave too large a space between programmes, as the Dragon leaves the lens of the blank tape, and the recorder motor hums, and responds with an FO error.
- 6) If the above points fail, try removing the jackplug to our socket when recording and removing the jackplug to our socket when playing back, as sometimes a lead-back loop is formed and corrupts the data.

B Jones

19 Goffs Park

Marston

North

West Gloucestershire

Compiling the errors

A few errors crept into my *A Computer program* printed in the 24 February/3 March issue of your magazine. I have listed the corrections below:

```
Line 31 ... PRINT "0";
Line 36 ... PRINT "00" AND
PRINT "10" TO 4
      THEN
Line 38 ... RETURN "0" TO 4
      THEN
Line 39 ... AND PRINT "0" TO "C"
```

Also I would be grateful if you would publish the fact that my first name is Richard, not Robin as printed.

Richard Wright

24 Ken Road

Richmond TW9 3JX

Undeserving astrologers

In this scientific and so-called "enlightened" age, I find the supply of astrology software as the ultimate insult to human intelligence. It makes me consider whether or not we deserve the technology we use.

Perhaps, it is fortunate that computers cannot as yet think! Z P West
31 Wakehurst Place
Roxington
West Sussex

Software libraries defended

On the subject of software libraries, we believe that your readers will find the following of interest to them.

Part of our business at Citrussoft Computers is the running of such a library dedicated to the Dragon microcomputer. It is our policy to approach software suppliers suggesting that a financial agreement be reached to enable us to list our their programs. So far, we have reached agreement with 70 percent of the software suppliers who have responded to our initial contact. The minority of suppliers who do not agree to the listing of their software are however keen for the sale of their software to proceed.

Therefore, at present our library has a possible content of approximately 70 different software titles. We are also

able to offer for sale at special price 90 plus pieces of software for the Dragon. Members thus have the opportunity of stamping a majority of software before contemplating purchase.

As previously intimated the position is changing weekly as additional suppliers make contact and as new software is received.

I hope the above facts help to allay the fears of any Dragon owners concerned that they might join a library only to find it held through lack of software — but please inquire as to whether agreements have been made with software suppliers.

David and Susan

Thornhams

Citrussoft Computers

Park Hill

Wood Norton

Glouce

Womp-Rat

A new game for ZX Spectrum by Derek Spring

IN Womp-Rat, you are the son of a lonely impetuous farmer. Your mission is to defend the farm from the hordes of thirsty Womp-Rats which are attacking it.

The Womp-Rats start from the top of the screen and move down towards your farm at the bottom. You are in the middle and can move left or right, firing your beam lasers up at the Womp-Rats until they pass you. Then you can turn 180 degrees to fire down at the remainder. You can only turn once each row of Womp-Rats and the

number of rats increases with each successive wave.

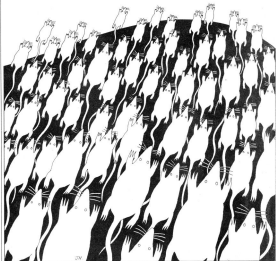
The program was written to make use of Dot Pin as a Left or Right Strimp. Lines 10-190 set up the screen, the graphic characters and the string which contains the Womp-Rats. Lines 210-230 control the movement of the rats.

Lines 250-320 control your movement, and check to see if you are firing or turning. Lines 340-380 are your firing routine, while 400-430 check to see if you are out of the

limits of the screen. Lines 440-510 are the instructions, while 6000-6030 are data for the graphics characters.

The figures in lines 20-30 correspond to graphics character keys, all being used with Caps Shift except F6 and G6. Lines 170, 180, 280, 380, 390, 390 contain the defined graphics characters.

The speed of the game can be changed in line 310 by altering the maximum value of G, but 5 seems best.



ON

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Tomorrow's heroes

David Kelly talks to Nick Alexander, head of the newly-formed Virgin Games.

Computers are the latest arena into which media-magnate Richard Branson is nudging his Virgin Group of companies. Branson's decision to go for video games will add another facet to an empire that has a turnover of £50m and spans the record, film, book and video industries.

This new venture, called Virgin Games (see *Popular Computing Weekly*, February 24), is located in minuscule offices in London's Portico Place. Nick Alexander, boss of the new company, has only been in the job for five weeks, but already he has a clear idea of what he hopes to achieve: "We will work on similar lines to a record company. Instead of having in-house programmers, we will build up a roster of successful freelancers, using Virgin's substantial resources to promote them."

The record industry is something Nick is familiar with. After leaving college, he worked for EMI records marketing such bands as Arctic Monkeys and Gerry McPhee Runners.

After becoming Marketing Manager for HMV Record Stores, he got his first taste of computers when he was appointed to market them. Then EMI's push into the video games market.

"At credit to a chap at Thorn EMI called Bryan Turner. He saw the potential in video games five years ago and he steadily built up a number of titles. When I joined all the titles were already there. What I was so pleased about, particularly as I had to market them, was that the software was original — we didn't have Space Invaders and Pac-Man rip-offs."

"What I did was to take all the programs available and put them out. Rather than just releasing five or six, we wanted to make a big impact. We didn't expect the titles to sell well — we recognised that there were some weaker programs. The problem really for Thorn was that all the material had been produced in a vacuum — they had never been in video games before."

Virgin birth

Towards the end of last year the managing director of Virgin's record chain left to go to a video company. And, largely because of Nick's earlier success in giving the HMV record stores a facelift, Richard Branson approached him to see if he would be interested in the job. "I said that I felt the video games market was more interesting. Richard said it was something he had been looking at too, so the idea of Virgin Games was born — it was really a series of coincidences."

"At the moment what we are looking for is existing programs to put out. Already I



have been sent some material that is quite remarkable — there are people writing some very different kinds of games."

Nick is keen that Virgin Games should not get involved in doing versions of established arcade games for home computers — he feels this is a destructive approach. "Virgin will operate as a marketing and distribution centre. The emphasis will be on individuals."

"I'm looking for a pool of freelance machine-code programmers who have some material so we can start to build their name. With some of the smaller companies we will credit their organisations, but it is much harder to market a software house than an individual in a way to catch the imagination of the public."

"I am sure that it is an almost inevitable part of the way the market will build up that there will be 'video stars'."

"I strongly believe that Another Title from Virgin Games is less interesting than Another Title from Joe Bloggs."

"We should have the first game out at the beginning of June — this gives us plenty of time to get our distribution sorted out before Christmas. I would like to see us put out 30 titles this year. It is unlikely that we will offer the same game on more than one machine in the beginning — I would prefer to pick up titles that we could launch simultaneously on more than one machine but, for a program in machine-code, that is not so easy. Besides, different sorts of people buy different computers. The sort of game that would be a sure-fire success on the Atari need not necessarily do well on the BBC."

The new company is interested in software for any machine, currently available, if the Cric can be produced in quantity, then Virgin will do material for that too. "The Cric could be like the Dragon: I was amazed how the Dragon 32 sold with virtually no software back-up. I think that situation is changing though — as the market broadens, attention will switch from the hardware to the software."

The software market is still growing at a phenomenal rate. Nick points to market research which shows that 90 percent of those who buy a computer do so to learn to

program. Six months later only 10 percent have done so. The rest are playing games.

To begin with, Virgin software will be cassette based. "We will keep an open mind — I have no hard and fast feeling for the carrier for our software. I don't see any rush to get into Rom for example — and I think people are happy to pay a bit less for their games. The only advantage was for piracy reasons, cassettes being more difficult to copy, but I have recently discovered that it is comparatively easy to pirate Roms. In the US there are now ways of easily down-loading Roms into a sort of Eprom. As far as I'm concerned, cartridge software now looks less attractive."

"Presentation is one of Virgin's strengths and our packaging will be innovative. We also have to try to discourage people from borrowing a friend's copy of one of our cassettes. Home taping is an enormous danger. We have seen the video-tape business almost destroyed over the last two years."

No incentive

Even now 75 to 80 percent of the video market is illegal material. If that was to happen to the software market, Nick reckons the supply of new games would just dry up — there would be no incentive.

Nick sees the new Virgin Games subsidiary as being ideally placed in the market. "We have the resources to put behind a product to market it for all its worth and to put it out to as wide an audience as possible. I see our immediate competition as companies like Quicksilver and Bug Byte rather than Atari and Thorn. And with the resources within Virgin, we can sell more copies of a given program than they would be able to."

As for Virgin, the parent company is obviously taking the venture seriously. "Richard is aware that the record industry is not going to continue to grow at the rate it has done. He is excited that video games could be one future for Virgin."

"The cult heroes of tomorrow could be the computer programmers, not the musicians. Rather than programmers putting on sequinned suits, maybe we will have to redefine what a super-star looks like!" ■

A word or two in your ear

Keith and Steven Brain take a close look at *Teletexter* — a Dragon word-processor.

One of the advantages of the 'lock-and-key' design of the Dragon is that numerous programs have already been developed in the US for the Tandy Colour Computer, although certain differences in the firm mean that some programs are not directly interchangeable. Without doubt one of the most impressive programs produced for the Tandy Colour Computer is a word-processing package known as *Teletexter*. A new version of this program, specially modified for the Dragon, has now been launched in the UK by Microdeal. At £55 it must be the most expensive Dragon program on offer, as what exactly does it do and can any software be worth a quarter of the cost of the computer it runs on?

The basic function of a word-processor is to create and store text in a computer in such a form that it can easily be edited, formatted and printed. Word-processing is rapidly becoming the norm in the business world, but trying to exploit the value of word-processing to those who have never used it is like the old Bob Newhart record where he plays Sir Walter Raleigh trying to explain tobacco to the court of Queen Elizabeth the First: while word-processing is every bit as habit-forming as smoking, the side-effects are probably restricted to asthma and perhaps an inability to write without a keyboard and ribbon.

In essence, a word-processor replaces 'rough drafts', 'notes on scrap paper' (or backs of envelopes), and repeated rewriting of commonly-used text. It enables you to type out your first thoughts and then easily modify them as your ideas change, before finally arranging them on the page in the most suitable way and printing them out. A standard office package like *Wordstar* costs around £250 and runs on a 12,000 machine.

Market timing

Teletexter comes on cassette and consists of a machine code file, which is loaded by *Quasi* in less than a minute, and started by *Erec*. The cassette contains four versions of the program, but these only differ in that they are configured for different printers. It also contains a demonstration text program and the *Convert* program. The programs are repeated on the reverse side. In addition, the package includes comprehensive documentation, comprising the *Teletexter Tutorial*, *Reference Manual* and *Moving Files* Programs in and out of *Teletexter*.

The tutorial starts from scratch and assumes no previous knowledge of programming or word-processing. It provides a step-by-step introduction to the various features of *Teletexter* in a very well-presented, accurate and understandable form. The reference manual covers much

of the same ground, but in a more ordered format, and has a comprehensive index and a useful command summary table. Although the program was originally written as a word-processor, it can also be used as an extended editor for Basic programs, with the aid of *Convert*.

The only little complaint about the documentation is that the alterations for the Dragon version were obviously done with good old-fashioned Tippex rather than *Teletexter* (apparently because the only copy of the text was on the non-compatible Tandy disc version and in the US).

When *Teletexter* is executed, a copyright notice appears. Pressing Enter leads to the main menu, where the available commands appear in inverse video. These are Create, Edit, Save, % Save, Read in, Append, Verify, Format and Words. The main menu also gives the name of the last file read in and the amount of space remaining for text. At start-up, space is a very reasonable 18,500 characters (about 34 pages), which compares well with about 7,000 in *Wordstar* on the micro.

Pressing the appropriate key (first letter of word) carries out your command. Create and Read in are the only commands which destroy the material already in the text buffer, and they are certainly mug-tugging, requiring upper case confirmation of your intentions before being acted on. Edit leads you to the text currently in the buffer, returning you to your last position in the file.

The Save command requests a filename and then transfers the whole text file to cassette. As files are saved as machine code, transfer is much faster than with other low-cost systems which use *App* dumps. The useful % Save feature (called as % I) allows you to save individual parts of a file, while Append allows you to add



another file from tape to the text already in the buffer (very useful for dealing with 'standard' text and for merging programs).

Verify checks that your text has been saved successfully, before you delete your file, and is an essential part of any serious text-processor. As the program contains a useful Auto-verify mechanism, it does not crash if you start to playback in the middle of a file, so rewinding the tape to the start every time is not necessary.

Calling Words displays the number of words and lines in the current file. The final command is Format, which takes you to the second (Format) menu which is concerned with arranging text for printout.

When you press 'C' to create your first file, the screen clears to buff. A black L-shaped cursor flashes in the top left-hand corner next to a small black square, which marks the end of the file.

Instead of the normal very limited 32 columns by 16 lines display of the Dragon, with inverse graphics to represent lower-case, a much more useful 51 column by 24 lines display, with true lower-case, appears magically before your eyes! With-

Teletexter - Create to start new file
Last Error - error in loading of file

1 - standard word file
2 - standard document for 12000 disk
3 - user definable control codes

Press ESC (255455) - new file

1 - to create new text file (teletexter .txt)
2 - to save text to loader (see teletexter.txt)
3 - save all text in buffer to file
4 - to save current block of text to file
5 - load to text file from tape
6 - append text to text buffer to end of buffer
7 - modify (change) tape to end of file on tape
8 - tape to formatted text
9 - word and line count (all or part of text)

Press FMT (54)

1 - clear screen, text, format, quit
2 - format (ESC 5)
3 - create (ESC 5)
4 - format (ESC)
5 - change (ESC)



out doubt this feature alone puts Teletexter streets ahead of any of other word-processing programs for the Dragon that we have seen. The display is quite clear, but looks even better if you turn down the color on your tv to give black and white. Even on an ancient 12in black and white portable, which we were using while writing this review, the picture was crystal clear. Shift-B switches between upper and lower-case, but holding shift down in lower-case mode also produces upper-case, as on a normal typewriter.

Streets ahead

If you continue to type, wordwrap will occur when you exceed 80 columns, so that words are not broken. Text is always inserted at the current cursor position, which can be moved one character or line in the appropriate direction with the four arrow keys. If shift is held down at the same time as a cursor key, auto-repeat enables you to move faster through the file, and scrolls the screen if the top or bottom is reached.

The Clear key is redefined as a Control key (that is special functions are assigned to other keys if they are pressed at the same time as Clear). For example, Clear and the arrow keys will move you to the top or bottom of the file, or the start or end of a line, while Clear/P pages you forward, and Clear - pages you backwards through the file. A character to the right of the cursor is deleted by **Back**, or a whole line may be killed with Clear R.

Global search and replace

When you insert additional text into an existing line, overflow may occur on to a continuation line below the current one, but the text can be simply realigned with Clear A. No horizontal screen scroll is provided, but this is not really necessary when you already have 80 (rather than 32) characters on a line. If you are entering columns of figures, you will find the Clear 7 Tab function useful.

If block markers are placed at the beginning (Clear B) and end (Clear E) of a section, Clear C will produce a Block Copy at the current cursor position. If only the end marker is placed, then Clear E will cause a Block Delete from the current cursor position to the end marker. Block Moves are achieved by combining Block Copy and Block Delete.

Another very useful control function is Clear G for Global Search and Replace, which will search the text for any pattern of characters which you define, and then allow you to automatically replace them. Clear H gives replacement and Clear M



moves you to the next occurrence of the pattern. This facility is extremely useful if you want to replace people's names in a letter, or if you cannot face typing something like 'cyclopentadecahydrophenanthrene' more than once!

If you start to insert text at the start of a long line the screen slows down, so the screen has to keep scrolling, but this can be overcome by use of SpeedMode which inserts a temporary file and. Finally, Clear M returns you to the main menu.

Obviously, you will want to get your words down on to paper at some point. Pressing F in the main menu accesses the format menu, where your printing parameters are set. If you now add press P, the text will be printed exactly as displayed on the screen (provided of course that you have a printer attached). The different versions of Teletexter allow you to use virtually any printer (except the idiosyncratic Sixelers), but even the humble Sekosha GP-108A we use at home costs more than the Dragon.

Line Spacing, Left Margin, Characters/Line, Upper Margin, Lines Page and Bottom Margin can all be specified, and all or part of a file may be printed. The default value for characters/line is 80. If this value is increased and EOL used to return to the text, most lines will overflow on to continuation lines. This looks a bit messy, but does not stop the program handling lines up to 99 characters long.

In addition, if Page is not set to zero, each page is numbered. Wait will halt after each page (for single sheets), and Close allows the sequential automatic loading and printing of a series of files on cassette, raising the effective memory capacity very high. If you use an Epson printer, then any of the four available fonts can be called. The final items on the format menu are Direct, which allows you to send Ascii codes straight to the printer, and Typewriter which sends text to the printer when you press Enter.

Another feature usually only found on full-scale word-processing programs is Jumbled Codes, which can be placed in the body of the text to modify printout at

that point. Format Codes can change any of the normal parameters to give indented, repeated or emphasised text, etc, while New Page automatically moves the printer on to the top of the next page. Centering of lines is supported and a Header (heading) can be printed at the top of every page. Finally, use of Define Direct lines at the start of a file means that special control codes (up to 15 characters long) can easily be inserted anywhere in the text.

Basic programs saved in the normal manner are not compatible with Teletexter, so conversion is needed. To get Basic into the correct form, you first need to save the program as an Ascii dump by Clear/Master A. The Convert program on the Microcal tape is then loaded and the Ascii dump read in and converted to a new machine-code file which is compatible with Teletexter. Convert also works in the opposite direction, to make Basic-compatible Ascii dumps of programs written within Teletexter.

This method enables you to have a full screen editor which has all the functions (like line wrap, replace and copy) which you wish had been included in the normal Dragon editor. You can also use it to merge programs via Append, or to include actual program lines in documentation. Although you can write Basic in Teletexter, you have to be a little careful about entering all your lines correctly. And, as you cannot Run the program within Teletexter, you will have to finally debug it later.

The only things obviously missing from Teletexter are justification (alignment) of the right-hand margin, so that the output appears 'typed' rather than in true 'printed' form, and an on-screen word, line and page status display. If these particular features are of over-riding importance, then you must look elsewhere, but you are going to have to do without a lot of other important features if you opt for one of the other Dragon word-processing packages.

Conclusion

Teletexter is undoubtedly a 'real' word-processor which provides an excellent tool for the serious Dragon user. It is suitable for the small business, or the professional writer, as well as taking care of home word-processing chores (if you can't imagine a home word-processing chore you should watch those kids fighting to be first to use it for their English homeworks. We are used to Windows or a Superstar, but have not noticed that much practical capability has been lost in coming down to this level. The price may look steep at first, but you really must compare it with something like the Microcal Rompac for the Vic20, which at £125 for fewer facilities no longer looks much of a bargain. Also, a disc version is under development for those who require greater storage capacity and more rapid access to records.

Teletexter is a highly recommended package which demonstrates the potential of the Dragon as a serious machine.



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Strikers Revenge

on T100

This original game takes place outside a factory. Unfortunately two of your workers are standing on the roof throwing "things" at you. You (the boss) and a director have the skilled job of catching the dropped items and then running to the waiting ferry

on the left which will give off.

You must then move back and catch more — BUT: there are only two minutes to grab as many as possible and you are only allowed to drop five things. If you manage to catch twenty you can get your revenge (on the workers) by firing them!

It is not as easy as it sounds — so why not try it? Movement instructions are in the program. Beware, things speed up!

Program notes

- 5-55 Set variables
- 25-45 Use graphics graphics
- 75-135 Screen display
- 155-165 Decides what is thrown and by whom
- 175-200 Picks the "things" on to the screen
- 205-215 Checks if objects caught
- 220-235 Checks keyboard, positions
- 240-255 Dropped object
- 260-280 Caught object
- 285-320 Endgame remarks
- 325-335 Set up next screen
- 335-415 Instructions

Main variables

- M = Tabulation for printing men
- MS = String for printing the men
- L05-L25 = Various long strings
- PO = Position of object
- D = Amount of objects dropped
- SC = Score

```

10 SCREEN=0
20 GOTO 100
30 REM *****
40 REM *****
50 REM *****
60 REM *****
70 REM *****
80 REM *****
90 REM *****
100 REM *****
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1250 REM *****
1260 REM *****
1270 REM *****
1280 REM *****
1290 REM *****
1300 REM *****
1310 REM *****
1320 REM *****
1330 REM *****
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1350 REM *****
1360 REM *****
1370 REM *****
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1570 REM *****
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1610 REM *****
1620 REM *****
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1880 REM *****
1890 REM *****
1900 REM *****
1910 REM *****
1920 REM *****
1930 REM *****
1940 REM *****
1950 REM *****
1960 REM *****
1970 REM *****
1980 REM *****
1990 REM *****

```

Strikers Revenge
by Simon Trew

Lunar Lander

on Argos 32

The program as listed is for use with a joystick. To change the game to play with

the UP/LEFT/RIGHT arrowed keys add change

```

100 REM *****
110 REM *****
120 REM *****
130 REM *****
140 REM *****
150 REM *****
160 REM *****
170 REM *****
180 REM *****
190 REM *****
200 REM *****
210 REM *****
220 REM *****
230 REM *****
240 REM *****
250 REM *****
260 REM *****
270 REM *****
280 REM *****
290 REM *****
300 REM *****
310 REM *****
320 REM *****
330 REM *****
340 REM *****
350 REM *****
360 REM *****
370 REM *****
380 REM *****
390 REM *****
400 REM *****
410 REM *****
420 REM *****
430 REM *****
440 REM *****
450 REM *****
460 REM *****
470 REM *****
480 REM *****
490 REM *****
500 REM *****
510 REM *****
520 REM *****
530 REM *****
540 REM *****
550 REM *****
560 REM *****
570 REM *****
580 REM *****
590 REM *****
600 REM *****
610 REM *****
620 REM *****
630 REM *****
640 REM *****
650 REM *****
660 REM *****
670 REM *****
680 REM *****
690 REM *****
700 REM *****
710 REM *****
720 REM *****
730 REM *****
740 REM *****
750 REM *****
760 REM *****
770 REM *****
780 REM *****
790 REM *****
800 REM *****
810 REM *****
820 REM *****
830 REM *****
840 REM *****
850 REM *****
860 REM *****
870 REM *****
880 REM *****
890 REM *****
900 REM *****
910 REM *****
920 REM *****
930 REM *****
940 REM *****
950 REM *****
960 REM *****
970 REM *****
980 REM *****
990 REM *****

```

add if (KEY)=1 then add

Change instructions from line 820 onwards to use the arrowed keys and the space bar to turn off engines. The Rest lines explain how the program works.

```

10 REM *****
20 REM *****
30 REM *****
40 REM *****
50 REM *****
60 REM *****
70 REM *****
80 REM *****
90 REM *****
100 REM *****
110 REM *****
120 REM *****
130 REM *****
140 REM *****
150 REM *****
160 REM *****
170 REM *****
180 REM *****
190 REM *****
200 REM *****
210 REM *****
220 REM *****
230 REM *****
240 REM *****
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260 REM *****
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280 REM *****
290 REM *****
300 REM *****
310 REM *****
320 REM *****
330 REM *****
340 REM *****
350 REM *****
360 REM *****
370 REM *****
380 REM *****
390 REM *****
400 REM *****
410 REM *****
420 REM *****
430 REM *****
440 REM *****
450 REM *****
460 REM *****
470 REM *****
480 REM *****
490 REM *****
500 REM *****
510 REM *****
520 REM *****
530 REM *****
540 REM *****
550 REM *****
560 REM *****
570 REM *****
580 REM *****
590 REM *****
600 REM *****
610 REM *****
620 REM *****
630 REM *****
640 REM *****
650 REM *****
660 REM *****
670 REM *****
680 REM *****
690 REM *****
700 REM *****
710 REM *****
720 REM *****
730 REM *****
740 REM *****
750 REM *****
760 REM *****
770 REM *****
780 REM *****
790 REM *****
800 REM *****
810 REM *****
820 REM *****
830 REM *****
840 REM *****
850 REM *****
860 REM *****
870 REM *****
880 REM *****
890 REM *****
900 REM *****
910 REM *****
920 REM *****
930 REM *****
940 REM *****
950 REM *****
960 REM *****
970 REM *****
980 REM *****
990 REM *****

```

```

1000 REM *****
1010 REM *****
1020 REM *****
1030 REM *****
1040 REM *****
1050 REM *****
1060 REM *****
1070 REM *****
1080 REM *****
1090 REM *****
1100 REM *****
1110 REM *****
1120 REM *****
1130 REM *****
1140 REM *****
1150 REM *****
1160 REM *****
1170 REM *****
1180 REM *****
1190 REM *****
1200 REM *****
1210 REM *****
1220 REM *****
1230 REM *****
1240 REM *****
1250 REM *****
1260 REM *****
1270 REM *****
1280 REM *****
1290 REM *****
1300 REM *****
1310 REM *****
1320 REM *****
1330 REM *****
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1460 REM *****
1470 REM *****
1480 REM *****
1490 REM *****
1500 REM *****
1510 REM *****
1520 REM *****
1530 REM *****
1540 REM *****
1550 REM *****
1560 REM *****
1570 REM *****
1580 REM *****
1590 REM *****
1600 REM *****
1610 REM *****
1620 REM *****
1630 REM *****
1640 REM *****
1650 REM *****
1660 REM *****
1670 REM *****
1680 REM *****
1690 REM *****
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1840 REM *****
1850 REM *****
1860 REM *****
1870 REM *****
1880 REM *****
1890 REM *****
1900 REM *****
1910 REM *****
1920 REM *****
1930 REM *****
1940 REM *****
1950 REM *****
1960 REM *****
1970 REM *****
1980 REM *****
1990 REM *****

```

Run to page 18

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Sparkle

on Dragon 32

This program is designed to work on a Dragon 32. It uses the standard graphics characters available on the Dragon to give an impressive kaleidoscopic effect using most of the available colour set when using the text screen.

- 1 The program gives an endless display of colourful symmetrical patterns.

L=Length of line
G=First number of
AB=Graphics string

Program notes

- 2-5 Clear screen and
- 7 Settle window
- 9 Change direction
- 10-17 Display full page
- 18 Return to start of

1 FROM SPARKLE
2-17 G L

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Serious Application Software
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(Please specify)

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★ David Lawrence,
author of 'Working
Dragon' explains how
to handle Data Files

★ Which software
program should
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DRAGON
USER



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We may also be supplied on application to the subscription department

[illegible][illegible][illegible]

Lunar Landing for Driver Jackson

Source

1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025, 2026, 2027, 2028, 2029, 2030, 2031, 2032, 2033, 2034, 2035, 2036, 2037, 2038, 2039, 2040, 2041, 2042, 2043, 2044, 2045, 2046, 2047, 2048, 2049, 2050, 2051, 2052, 2053, 2054, 2055, 2056, 2057, 2058, 2059, 2060, 2061, 2062, 2063, 2064, 2065, 2066, 2067, 2068, 2069, 2070, 2071, 2072, 2073, 2074, 2075, 2076, 2077, 2078, 2079, 2080, 2081, 2082, 2083, 2084, 2085, 2086, 2087, 2088, 2089, 2090, 2091, 2092, 2093, 2094, 2095, 2096, 2097, 2098, 2099, 2100, 2101, 2102, 2103, 2104, 2105, 2106, 2107, 2108, 2109, 2110, 2111, 2112, 2113, 2114, 2115, 2116, 2117, 2118, 2119, 2120, 2121, 2122, 2123, 2124, 2125, 2126, 2127, 2128, 2129, 2130, 2131, 2132, 2133, 2134, 2135, 2136, 2137, 2138, 2139, 2140, 2141, 2142, 2143, 2144, 2145, 2146, 2147, 2148, 2149, 2150, 2151, 2152, 2153, 2154, 2155, 2156, 2157, 2158, 2159, 2160, 2161, 2162, 2163, 2164, 2165, 2166, 2167, 2168, 2169, 2170, 2171, 2172, 2173, 2174, 2175, 2176, 2177, 2178, 2179, 2180, 2181, 2182, 2183, 2184, 2185, 2186, 2187, 2188, 2189, 2190, 2191, 2192, 2193, 2194, 2195, 2196, 2197, 2198, 2199, 2200, 2201, 2202, 2203, 2204, 2205, 2206, 2207, 2208, 2209, 2210, 2211, 2212, 2213, 2214, 2215, 2216, 2217, 2218, 2219, 2220, 2221, 2222, 2223, 2224, 2225, 2226, 2227, 2228, 2229, 2230, 2231, 2232, 2233, 2234, 2235, 2236, 2237, 2238, 2239, 2240, 2241, 2242, 2243, 2244, 2245, 2246, 2247, 2248, 2249, 2250, 2251, 2252, 2253, 2254, 2255, 2256, 2257, 2258, 2259, 2260, 2261, 2262, 2263, 2264, 2265, 2266, 2267, 2268, 2269, 2270, 2271, 2272, 2273, 2274, 2275, 2276, 2277, 2278, 2279, 2280, 2281, 2282, 2283, 2284, 2285, 2286, 2287, 2288, 2289, 2290, 2291, 2292, 2293, 2294, 2295, 2296, 2297, 2298, 2299, 2300, 2301, 2302, 2303, 2304, 2305, 2306, 2307, 2308, 2309, 2310, 2311, 2312, 2313, 2314, 2315, 2316, 2317, 2318, 2319, 2320, 2321, 2322, 2323, 2324, 2325, 2326, 2327, 2328, 2329, 2330, 2331, 2332, 2333, 2334, 2335, 2336, 2337, 2338, 2339, 2340, 2341, 2342, 2343, 2344, 2345, 2346, 2347, 2348, 2349, 2350, 2351, 2352, 2353, 2354, 2355, 2356, 2357, 2358, 2359, 2360, 2361, 2362, 2363, 2364, 2365, 2366, 2367, 2368, 2369, 2370, 2371, 2372, 2373, 2374, 2375, 2376, 2377, 2378, 2379, 2380, 2381, 2382, 2383, 2384, 2385, 2386, 2387, 2388, 2389, 2390, 2391, 2392, 2393, 2394, 2395, 2396, 2397, 2398, 2399, 2400, 2401, 2402, 2403, 2404, 2405, 2406, 2407, 2408, 2409, 2410, 2411, 2412, 2413, 2414, 2415, 2416, 2417, 2418, 2419, 2420, 2421, 2422, 2423, 2424, 2425, 2426, 2427, 2428, 2429, 2430, 2431, 2432, 2433, 2434, 2435, 2436, 2437, 2438, 2439, 2440, 2441, 2442, 2443, 2444, 2445, 2446, 2447, 2448, 2449, 2450, 2451, 2452, 2453, 2454, 2455, 2456, 2457, 2458, 2459, 2460, 2461, 2462, 2463, 2464, 2465, 2466, 2467, 2468, 2469, 2470, 2471, 2472, 2473, 2474, 2475, 2476, 2477, 2478, 2479, 2480, 2481, 2482, 2483, 2484, 2485, 2486, 2487, 2488, 2489, 2490, 2491, 2492, 2493, 2494, 2495, 2496, 2497, 2498, 2499, 2500, 2501, 2502, 2503, 2504, 2505, 2506, 2507, 2508, 2509, 2510, 2511, 2512, 2513, 2514, 2515, 2516, 2517, 2518, 2519, 2520, 2521, 2522, 2523, 2524, 2525, 2526, 2527, 2528, 2529, 2530, 2531, 2532, 2533, 2534, 2535, 2536, 2537, 2538, 2539, 2540, 2541, 2542, 2543, 2544, 2545, 2546, 2547, 2548, 2549, 2550, 2551, 2552, 2553, 2554, 2555, 2556, 2557, 2558, 2559, 2560, 2561, 2562, 2563, 2564, 2565, 2566, 2567, 2568, 2569, 2570, 2571, 2572, 2573, 2574, 2575, 2576, 2577, 2578, 2579, 2580, 2581, 2582, 2583, 2584, 2585, 2586, 2587, 2588, 2589, 2590, 2591, 2592, 2593, 2594, 2595, 2596, 2597, 2598, 2599, 2600, 2601, 2602, 2603, 2604, 2605, 2606, 2607, 2608, 2609, 2610, 2611, 2612, 2613, 2614, 2615, 2616, 2617, 2618, 2619, 2620, 2621, 2622, 2623, 2624, 2625, 2626, 2627, 2628, 2629, 2630, 2631, 2632, 2633, 2634, 2635, 2636, 2637, 2638, 2639, 2640, 2641, 2642, 2643, 2644, 2645, 2646, 2647, 2648, 2649, 2650, 2651, 2652, 2653, 2654, 2655, 2656, 2657, 2658, 2659, 2660, 2661, 2662, 2663, 2664, 2665, 2666, 2667, 2668, 2669, 2670, 2671, 2672, 2673, 2674, 2675, 2676, 2677, 2678, 2679, 2680, 26

This program is designed to work on a Dragon 32. It uses the standard graphics characters available on the Dragon to give an impressive kaleidoscopic effect using most of the available colour set when using the text screen.

The program gives an endless display of colorful commercial patterns.

[illegible]

1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025, 2026, 2027, 2028, 2029, 2030, 2031, 2032, 2033, 2034, 2035, 2036, 2037, 2038, 2039, 2040, 2041, 2042, 2043, 2044, 2045, 2046, 2047, 2048, 2049, 2050, 2051, 2052, 2053, 2054, 2055, 2056, 2057, 2058, 2059, 2060, 2061, 2062, 2063, 2064, 2065, 2066, 2067, 2068, 2069, 2070, 2071, 2072, 2073, 2074, 2075, 2076, 2077, 2078, 2079, 2080, 2081, 2082, 2083, 2084, 2085, 2086, 2087, 2088, 2089, 2090, 2091, 2092, 2093, 2094, 2095, 2096, 2097, 2098, 2099, 2100, 2101, 2102, 2103, 2104, 2105, 2106, 2107, 2108, 2109, 2110, 2111, 2112, 2113, 2114, 2115, 2116, 2117, 2118, 2119, 2120, 2121, 2122, 2123, 2124, 2125, 2126, 2127, 2128, 2129, 2130, 2131, 2132, 2133, 2134, 2135, 2136, 2137, 2138, 2139, 2140, 2141, 2142, 2143, 2144, 2145, 2146, 2147, 2148, 2149, 2150, 2151, 2152, 2153, 2154, 2155, 2156, 2157, 2158, 2159, 2160, 2161, 2162, 2163, 2164, 2165, 2166, 2167, 2168, 2169, 2170, 2171, 2172, 2173, 2174, 2175, 2176, 2177, 2178, 2179, 2180, 2181, 2182, 2183, 2184, 2185, 2186, 2187, 2188, 2189, 2190, 2191, 2192, 2193, 2194, 2195, 2196, 2197, 2198, 2199, 2200, 2201, 2202, 2203, 2204, 2205, 2206, 2207, 2208, 2209, 2210, 2211, 2212, 2213, 2214, 2215, 2216, 2217, 2218, 2219, 2220, 2221, 2222, 2223, 2224, 2225, 2226, 2227, 2228, 2229, 2230, 2231, 2232, 2233, 2234, 2235, 2236, 2237, 2238, 2239, 2240, 2241, 2242, 2243, 2244, 2245, 2246, 2247, 2248, 2249, 2250, 2251, 2252, 2253, 2254, 2255, 2256, 2257, 2258, 2259, 2260, 2261, 2262, 2263, 2264, 2265, 2266, 2267, 2268, 2269, 2270, 2271, 2272, 2273, 2274, 2275, 2276, 2277, 2278, 2279, 2280, 2281, 2282, 2283, 2284, 2285, 2286, 2287, 2288, 2289, 2290, 2291, 2292, 2293, 2294, 2295, 2296, 2297, 2298, 2299, 2300, 2301, 2302, 2303, 2304, 2305, 2306, 2307, 2308, 2309, 2310, 2311, 2312, 2313, 2314, 2315, 2316, 2317, 2318, 2319, 2320, 2321, 2322, 2323, 2324, 2325, 2326, 2327, 2328, 2329, 2330, 2331, 2332, 2333, 2334, 2335, 2336, 2337, 2338, 2339, 2340, 2341, 2342, 2343, 2344, 2345, 2346, 2347, 2348, 2349, 2350, 2351, 2352, 2353, 2354, 2355, 2356, 2357, 2358, 2359, 2360, 2361, 2362, 2363, 2364, 2365, 2366, 2367, 2368, 2369, 2370, 2371, 2372, 2373, 2374, 2375, 2376, 2377, 2378, 2379, 2380, 2381, 2382, 2383, 2384, 2385, 2386, 2387, 2388, 2389, 2390, 2391, 2392, 2393, 2394, 2395, 2396, 2397, 2398, 2399, 2400, 2401, 2402, 2403, 2404, 2405, 2406, 2407, 2408, 2409, 2410, 2411, 2412, 2413, 2414, 2415, 2416, 2417, 2418, 2419, 2420, 2421, 2422, 2423, 2424, 2425, 2426, 2427, 2428, 2429, 2430, 2431, 2432, 2433, 2434, 2435, 2436, 2437, 2438, 2439, 2440, 2441, 2442, 2443, 2444, 2445, 2446, 2447, 2448, 2449, 2450, 2451, 2452, 2453, 2454, 2455, 2456, 2457, 2458, 2459, 2460, 2461, 2462, 2463, 2464, 2465, 2466, 2467, 2468, 2469, 2470, 2471, 2472, 2473, 2474, 2475, 2476, 2477, 2478, 2479, 2480, 2481, 2482, 2483, 2484, 2485, 2486, 2487, 2488, 2489, 2490, 2491, 2492, 2493, 2494, 2495, 2496, 2497, 2498, 2499, 2500, 2501, 2502, 2503, 2504, 2505, 2506, 2507, 2508, 2509, 2510, 2511, 2512, 2513, 2514, 2515, 2516, 2517, 2518, 2519, 2520, 2521, 2522, 2523, 2524, 2525, 2526, 2527, 2528, 2529, 2530, 2531, 2532, 2533, 2534, 2535, 2536, 2537, 2538, 2539, 2540, 2541, 2542, 2543, 2544, 2545, 2546, 2547, 2548, 2549, 2550, 2551, 2552, 2553, 2554, 2555, 2556, 2557, 2558, 2559, 2560, 2561, 2562, 2563, 2564, 2565, 2566, 2567, 2568, 2569, 2570, 2571, 2572, 2573, 2574, 2575, 2576, 2577, 2578, 2579, 2580, 2581, 2582, 2583, 2584, 2585, 2586, 2587, 2588, 2589, 2590, 2591, 2592, 2593, 2594, 2595, 2596, 2597, 2598, 2599, 2600, 2601, 2602, 2603, 2604, 2605, 2606, 2607, 2608, 2609, 2610, 2611, 2612, 2613, 2614, 2615, 2616, 2617, 2618, 2619, 2620, 2621, 2622, 2623, 2624, 2625, 2626, 2627, 2628, 2629, 2630, 2631, 2632, 2633, 2634, 2635, 2636, 2637, 2638, 2639, 2640, 2641, 2642, 2643, 2644, 2645, 2646, 2647, 2648, 2649, 2650, 2651, 2652, 2653, 2654, 2655, 2656, 2657, 2658, 2659, 2660, 2661, 2662, 2663, 2664, 2665, 2666, 2667, 2668, 2669, 2670, 2671, 2672, 2673, 2674, 2675, 2676, 2677, 2678, 2679, 26

L = Length of one line on the screen.
G = First number of graphics available.
Adj = Graphics string.

```

10-11 Displays full graphics window.
12 Returns to start menu pattern.

5. END SPHERE
6. CLS
7.  $\Delta t = 0.02$ ;  $\Omega = 0$ 
8.  $\Delta t = 0$ ;  $\Omega = 2$ ;  $\Delta t_0 = 0.02$ ;  $\Delta t = 0.02$ ;  $\Omega = 0.5$ 
9. CONTINUE

```

[illegible]

End Notes

World

1000

The World is for Z80[®] with Rampack. It is quite straightforward to input and can be printed on the ZX Printer using Copy or by

changing the Print statements to `Print`
the map occupies 30 lines of the display
so that the bottom 2 lines can be used for
files or possibly line items.

Readers may wish to try scrolling the picture to the left using `scrollLeft` or

machine code methods. Spectrum owners can experiment with colour to show the different contents and perhaps use a blue background for the sea.

A competition could easily be based on these ideas.



**The World
Now & Then**


```

1570 GOTO 1460
1575 REM*****
1580 DEFPROCEND
1590 CLS:PRINT:PRINTCHR$(32)CHR$(32)CHR$(48)G A M E O V E R ! ! !
1595 PRINTCHR$(27)CHR$(32)CHR$(32)CHR$(48)G A M E O V E R ! ! !
1600 FOR J=1 TO200:GOTO RND(1),-15,RND(124),1:NEXT
1610 SOUND 8,-15,80,20CLS
1620 PRINT:PRINTCHR$(32)G A M E O V E R B E E N R U N D E R
1630 PAGE$=""
1640 REM*****
1650 DEFPROCPLAY
1670 SOUND 1
1680 FOR J=1 TO200:GOTO RND(1),-15,RND(125),1:NEXT
1690 PRINT:PRINTCHR$(32)G A M E O V E R B E E N R U N D E R
1695 PRINTCHR$(32)CHR$(32)CHR$(48)G A M E O V E R B E E N R U N D E R
1710 FOR L=1 TO200:NEXT
1720 IF H=20 THEN SOUND 8,-15,80,10:GOTO 1600:GOTO 1600
1730 GOTO 1660
1740 DEFPROCEND
1750 CLS:FORJ=1 TO200:GOTO RND(1),-15,RND(125),1:NEXT GOTO 1600
1760 PRINT:PRINTCHR$(32)YOU HAVE RUN OUT OF AMMUNITION ! ! ! ! !PR(NT)PR(NT)PR(NT)
1770 PRINT:PRINTCHR$(32)YOU HAVE RUN OUT OF AMMUNITION ! ! ! ! !PR(NT)PR(NT)PR(NT)
1780 FOR J=1 TO200:NEXT:PRINTCHR$(32)CHR$(48)G A M E O V E R ! ! !
1790 GOTO 1600
1800 REM*****
1810 DEFPROCEND
1820 PRINT:PRINT:PRINTCHR$(32)YOUR RATING IS:
1830 IF D=10 THEN PRINT:AND YOU A ROBOT PROGRAMMED PERFECTLY!GOTO 1900
1840 IF D=9 THEN PRINT:AND YOU JOIN THE WAY?GOTO 1900
1850 IF D=8 THEN PRINT:YOU'VE PLAYED THIS GAME BEFORE!GOTO 1900
1860 IF D=7 THEN PRINT:NOT TOO BAD!GOTO 1900
1870 IF D=6 THEN PRINT:NOT TOO HOT!GOTO 1900
1880 IF D=5 THEN PRINT: I SUGGEST THE DOCTOR!GOTO 1900
1890 IF D=4 THEN PRINT:WELL, THE COMPUTER!GOTO 1900
1900 PRINT:PRINTCHR$(32)ANOTHER GAME W/N THE CPU!GOTO 1900 IF D=1 THEN PLAY
1910 IF D=1 THEN PLAY
1920 GOTO 1900

```

Java
 by James Schwan

Find the Crook on Spectrum

Your task is to identify a stolen criminal hiding among a crowd and to arrest him. A

reward of \$17,500 is given for your help. But you must act quickly as the reward decreases with time.

(WARNING!) Do not shoot an innocent person.

10-88 Colorized graphics.
 10-88 Based on a difficulty.
 10-88 Initialization (pressing the keys, then etc.)
 10-88 Main loop (reading the keys, controlling the game etc.)
 10-88 Ending
 1088-1100 Translations

```

10 REM *****
11 REM *****
12 REM *****
13 REM *****
14 REM *****
15 REM *****
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190 REM *****
191 REM *****
192 REM *****
193 REM *****
194 REM *****
195 REM *****
196 REM *****
197 REM *****
198 REM *****
199 REM *****
200 REM *****

```

Turn to page 23

OPEN FORUM

Year	1990	1995	2000
1990	1990	1995	2000

[illegible][illegible]

First Use Credit
New Customer Only

Panel

[illegible]

This program was inadvertently omitted from *Popular Computing Weekly*, February 24 — March 2. It is a multi-volume

Routine which can multiply two 14 digit numbers accurately, rather than rounding off the answer to the nearest nine digits.

The task was complicated because no functions such as Val could be applied to numbers greater than eight figures, as these would be rounded off. The solution

was to hold the relevant numbers in strings, together with simple variables set to the same length as the appropriate strings. This program, for a Z680, can be run in Fast, but this will prevent you from seeing the computer arrive at the answer that is due.

[illegible][illegible]

```

1000  IF NOT (A = 1) THEN GOTO 1100
1010  PRINT "YES"
1020  GOTO 1200
1030  PRINT "NO"
1040  GOTO 1200
1050  PRINT "END"
1060  GOTO 1200
1070  PRINT "END"
1080  GOTO 1200
1090  PRINT "END"
1100  PRINT "NO"
1110  GOTO 1200
1120  PRINT "END"
1130  GOTO 1200
1140  PRINT "END"
1150  GOTO 1200
1160  PRINT "END"
1170  GOTO 1200
1180  PRINT "END"
1190  PRINT "END"
1200  PRINT "END"
1210  PRINT "END"
1220  PRINT "END"
1230  PRINT "END"
1240  PRINT "END"
1250  PRINT "END"
1260  PRINT "END"
1270  PRINT "END"
1280  PRINT "END"
1290  PRINT "END"
1300  PRINT "END"
1310  PRINT "END"
1320  PRINT "END"
1330  PRINT "END"
1340  PRINT "END"
1350  PRINT "END"
1360  PRINT "END"
1370  PRINT "END"
1380  PRINT "END"
1390  PRINT "END"
1400  PRINT "END"
1410  PRINT "END"
1420  PRINT "END"
1430  PRINT "END"
1440  PRINT "END"
1450  PRINT "END"
1460  PRINT "END"
1470  PRINT "END"
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1490  PRINT "END"
1500  PRINT "END"
1510  PRINT "END"
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1600  PRINT "END"
1610  PRINT "END"
1620  PRINT "END"
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1640  PRINT "END"
1650  PRINT "END"
1660  PRINT "END"
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1680  PRINT "END"
1690  PRINT "END"
1700  PRINT "END"
1710  PRINT "END"
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1780  PRINT "END"
1790  PRINT "END"
1800  PRINT "END"
1810  PRINT "END"
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1830  PRINT "END"
1840  PRINT "END"
1850  PRINT "END"
1860  PRINT "END"
1870  PRINT "END"
1880  PRINT "END"
1890  PRINT "END"
1900  PRINT "END"
1910  PRINT "END"
1920  PRINT "END"
1930  PRINT "END"
1940  PRINT "END"
1950  PRINT "END"
1960  PRINT "END"
1970  PRINT "END"
1980  PRINT "END"
1990  PRINT "END"
2000  PRINT "END"

```

Parcell
 Joe M. Parcell

WANTED

HOT SHOT SOFTWARE WRITERS

REWARD

A LUCRATIVE SLICE OF THE GAMES SOFTWARE MARKET

During the last few months the standard of games software has continued to rise. Games enthusiasts all over the world are constantly seeking new challenges and now only the highest quality programmes can satisfy their demands. As more and more people acquire computers,

an ever increasing number find they have a flair for programming. Furthermore, established programmers are discovering that their skills are needed as much in this market as in the recognised business field. If YOU believe you have

that 'something extra' which can turn an ordinary programme into an internationally famous one, please write to us, enclosing as many demonstration tapes as you like, so that we can give you our opinion and let you know what we have to offer.

Accender Software, 26 Richmond Rd., London N11 2QR



All you need is love

Last week I reviewed *The Abbot*, a new Adventure for the Spectrum from Melbourne House. This week, let's return to a look at the 2001, a machine that refuses to lay down and be surprised by its flashy big brother, the Spectrum.

The 2001 is ideally suited to feel adventures — although many programs now include graphics, with varying degrees of success. In the future, it will be looking at adventures that I think succeed in one way or another.

For the moment, though, a little gripe! Remsoft, of Brighton, recently released an adventure called *Love*. The program is a fairly ordinary adventure, with the computer recognising some 250 words. But it differs from other adventures in two important ways. First of all, the protagonist is understood to be female, and second, the computer responds to emotional words such as kiss, cry, and so on, rather than the more conventional, active commands like *look*, *stab* or *spit*.

The authors, apparently, are female. Ms Bolton and Ms McIlwain have written an adventure of which most feminists would not approve. The whole atmosphere is charged with the helplessness of the poor female heroine, who can only respond to a situation by swooning or becoming coquettish. I found that even a command to "stop naked" (given, I'm afraid, in a moment of jocularity and frustration) was taken seriously by the computer. In this case the rest of the adventure was underlain by the male!

This is all fairly amusing, I suppose, but I wonder if it is doing anybody any good. The original idea of adventure programs is a quest for gold or similar treasures, not some kind of simpering mince through a gauntlet of lechers with unlikely-sounding names. In Carnal Software's *Black Crystal*, to use an example, the player may specify his sex at the start of the game, and the computer will endow the traditional kind of program with the appropriate slant. I think that this is what should be aimed for if sex is to be brought into adventure programs.

Remsoft's cynical approach, however,

though it may have seemed at the time of writing, is surely not going to endow its products to many people. If you think I am being too serious about all this, please let me know!

Enough from the pulp! As I said last week, I hope to be hearing from you with your thoughts on computer adventuring, as well as your own reviews of favourite programs. Do not hesitate to write in — I can only look at a small part of the total output of all the software houses.

To finish with, here is a location that you might like to include in your own adventure (it might even appear in PCW's adventures).

The player enters a room, in the middle of which stands a large stone table. A deep stream runs through the room, and on the far side of the table are three doors.

On the table hang three candles, which burn with an eerie blue-green flame. If the top candle is extinguished, the resulting smoke renders the player unconscious, to be carried away by elves to another, unknown location.

The smoke from the middle candle allows the player to hear the stream talking, and it may well tell him the correct door to take (the other two doors of course lead him in greater trouble). This lower candle explodes as the player attempts to snuff out the flame, and a strong Golem appears, to disfigure with the poor player.

This location could, of course, be adapted, so that the candles will react in a random way. The player may also, for instance, jump into the stream upon being attacked by the Golem, and be carried through a door (not necessarily the best one) by the water.

Let us have your ideas on adventure themes, monsters and so on, and remember: Always call a *Saving "G"*!

PS Entries are coming in thick and fast for The Hobbit competition (see Popular Computing Weekly, March 3-8, for details). The current leader is Peter Batty from Oxford who has completed 57.5 percent of the adventure.



This series of articles is designed for novice and experienced Adventurers alike. Each week Tony Bridge will be looking at different Adventures and advising you on some of the problems and pitfalls you can expect to encounter. So, if you have an Adventure you want reviewed, or if you are stuck in an Adventure and cannot progress any further, write to Tony Bridge, Adventure Corner, Popular Computing Weekly, Hobbiton Court, 19 Whitcombe Street, London WC2C 7HF.

Cruising Challenge

Can you beat the high score?

Can you beat the high score?

First there was *Space Invaders*, then there was *Pac-Man* — now there is *Cruising*. This action, machine code, arcade type game, will test your powers of coordination to the limit. Never before has a game asked you to think so quickly, or move so fast.

Achieving a high score on *Cruising* takes considerable skill, and not a little practice. Getting through the first four levels is not easy, and that's just the beginning.

Now you can make that skill work for you. Popular Computing Weekly is offering £10 each month to the player with the highest score on *Cruising*. All you have to do to enter this month's competition is send a print-out of your highest score, together with your name and address, to: Popular Computing Weekly, Cruising Challenge, Hobbiton Court, 19 Whitcombe Street, London WC2C 7HF.

Each month we will publish the name of the winner and the new *Cruising* high score. Are you good enough to accept the *Cruising* Challenge?

The highest score sent in so far this month is 550-0 from Julian Downs of 1 Maple Close, Sleaford, Leicestershire. If you have a higher score, you could still win this month's £10 — but hurry, entries close on March 31.

Notes

- Each entry must consist of a ZX printed and your name and address.
- Closing date for this month's Cruising Challenge entries is March 31.
- The highest score each month will receive £10.
- High scores cannot be transferred from one month to another.
- The judge's decision is final.
- Employees of Spectrum Publications Ltd or their families will be eligible to enter the Cruising Challenge.
- Cruising (4th December) for the 10th and 20th Spectrums is available through W. H. Smith and leading computer stores for just £15.95. It is also available (hardcover) from Sunbeam Books Ltd, Hobbiton Court, 19 Whitcombe Street, London WC2C 7HF.



A period history of the elements

Alick McWhirter presents a short routine on the first 20 elements in the Periodic Table.

This program has been designed to Run on the ZX4 SBC model B, but it should be quite easy to convert it to Run on other microcomputers. The program tests your knowledge on the first 20 elements of the Periodic Table, as these are particularly useful for chemistry students.

The Periodic Table was mainly created by Dmitri Mendeleev (1834-1907), who used the relative atomic mass numbers of the different elements to work out their placing on the table. By studying these numbers, he was also able to leave gaps for elements which he thought must exist but had not yet been discovered. He is now credited with putting the table into its modern form.

As shown in the illustrations, the program will test you on several basic facts about the given elements: the number of protons, neutrons or electrons; the valency, which ions are formed; or the electronic 'shell' arrangement.

For example, in the Periodic Table, oxygen is element Number 8 because it has 8 protons and 8 electrons in the neutral atom — this is called the relative atomic number.

There is a nucleus in the centre of each atom which contains the protons and neutrons. Electrons are arranged in different levels or 'shells' around the nucleus. Each level must be filled before the next is started.

Each element is stable (does not react easily with other elements) if it has its upper shell filled. For example, neon is very stable having 10 electrons — both the

first (2) and second (8) shells are filled.

If an element does not have a filled outer shell, it can form a compound with another element. An element with an almost empty top electron shell may lose an electron leaving it a complete shell and, in so doing, may give it to another element to complete an almost full shell. For example, hydrogen comprises one proton and one electron — the first shell is almost empty. Oxygen has a filled first shell (two electrons) and six electrons in its second shell — i.e. oxygen is two electrons short of a complete second shell.

To make both the oxygen and hydrogen atoms stable, they join up to form water (H_2O) — two hydrogen atoms join with one oxygen atom. Each hydrogen atom gives away one electron and becomes stable, while the oxygen atoms receive two electrons and also stabilise.

```
10MODEA
20VDUI9,2,4,0,0,0
30 REM *****
40 REM *   COPYRIGHT   *
50 REM *       OF       *
60 REM * A.L.MCWHIRTER *
70 REM *****
80 REM *****
90 DIM A$(10),B$(21),S$(21,6)
100 CLS
110 RESTORE
120 SC=8:CD=3
130 PRINT:PRINT:PRINT
140 PRINT"***** ELEMENTS *****"
150 PRINT"This program has been designed to test "
160 PRINT"your knowledge of the first 20 elements "
170 PRINT"of the 'Periodic Table'. It will test "
180 PRINT"you on one of the following subjects:"
190 PRINT
200 PRINT"          1) Number of protons "
210 PRINT"          2) Number of electrons "
220 PRINT"          3) Number of neutrons "
230 PRINT"          4) The electron arrangement "
240 PRINT"          5) The valency "
250 PRINT"          6) The ion "
260 PRINT
270 PRINT"It will ask you 20 questions and at the "
280 PRINT"end it will give you a percentage score "
290 PRINT"along with a comment on your perform-"
300 PRINT"ance."
310 PRINT
320 PRINT" PRESS RETURN TO CONTINUE..." : INPUT Z$
330 CLS
340 PRINT:PRINT:PRINT
350 PRINT"***** ELEMENTS *****"
360 PRINT" The answer to the questions on "
370 PRINT"protons, neutrons, electrons and "
380 PRINT"valency should be answered by a number:"
```


THE MicroComputer SOFTWARE CLUB

FOR OWNERS OF VIC, ZX81, SPECTRUM, BBC, OR DRAGON MICROCOMPUTERS

Buying software for your computer is a gamble. Apart from the occasional review and, perhaps, a recommendation from a friend, you have precious little information upon which to base your purchasing decision.

Advertisements and clever packaging can make the worst programs appear tremendous. It is not until you have "gambled" your money that you discover how good they really are. Some are only slightly delivered to others you may already own; many are not as good as you would be misled to expect; and others are just a complete waste of money. Of course, there are some excellent programs around, and many more appear monthly. Now there is a safe way of finding out about them.

- free membership -

THE MICROCOMPUTER SOFTWARE CLUB was started to make software purchasing easier, cheaper, and less risky. Membership is completely free of charge, as is the monthly Newsletter. Every month members receive full details on the best and latest programs available for their computer and, simply and confidently, are able to order any of the programs they choose at substantially less than normal prices.

— large savings — on top software

All programs are, at least, 10% cheaper than normal and, each month, the best of the most recent software is made available to members at 20% less than normal. Postage and packing is free on orders of two or more programs for delivery within the UK; ordering and payment are simple, and quality is guaranteed.

— no obligation —

Members are not obliged to buy a fixed number of programs from The Club. They buy what they want when they want. Whether it is one program in a year or one a month, they know that when they buy from THE MICROCOMPUTER SOFTWARE CLUB they are buying the best programs at the best prices.

— free Newsletter —

Our latest Newsletter offers programs from some leading suppliers - and from a few that, perhaps, you do not yet know. A program has to be good, very good, before it is recommended to members. It also has to be reliable and, even before the members' discount, it has to be good value for money. Subject coverage includes adventure, arcade, education, strategy games, household applications, family games, business, utilities and programming aids.

Remember, membership is completely free of charge and you are under no obligation to buy anything from The Club unless you really want to. If you own or use a Z8000 (16K), Spectrum (16K or 48K), BBC (A or B), Dragon 32, or VIC (expanded or unexpanded), you should join THE CLUB.

JOIN TODAY

THE MICROCOMPUTER SOFTWARE CLUB
P.O. Box 198, Oxford, OX2 9BL, England.

```
2000 PRINT
270 PRINT "it will ask you 20 questions and at the"
280 PRINT "and it will give you a percentage score"
290 PRINT "along with a comment on your perfora-"
300 PRINT "ance."
310 PRINT
320 PRINT "PRESS RETURN TO CONTINUE..." : INPUT J$
330 CLS
340 PRINT:PRINT:PRINT
350 PRINT "***** ELEMENTS *****"
360 PRINT "The answer to the questions on "
370 PRINT "protons, neutrons, electrons and "
380 PRINT "valency should be answered by a number!"
```


When is an 8K Vic not an 8K Vic?

Peter Wilson explains how you can run unexpanded programs on an expanded Vic20.

I belong to a computer club. A lot of the members, including myself, complained that when the Vic's memory was expanded you could not run some unexpanded programs without removing the extra memory, or the Super Expander cartridge.

To overcome this problem, I have written a small program to reconfigure the Vic's memory. When Run, the program asks you to press a number between 1 and

6, which sets the relevant Pokes. If you press 1, this will reconfigure the Vic so that user Ram starts at 4096, screen Ram at 7680 and colour Ram at 38400. If you press 2, user Ram will start at 1024, screen Ram at 7680 and colour Ram at 38480.

Pressing 3, 4, 5 or 6 will reconfigure the Vic so that user Ram starts at 4096, screen Ram at 4096 and colour Ram at 37588. In addition, number 3 sets the Vic's memory at 8K+, without taking the extra Ram — a condition that it could not set up on its own.

When this program is executed, it sets the Vic as if it had just been turned on and erases the reconfiguration program itself, so make a copy before Running it.

(One word of warning, do not try to set up a configuration which has Ram missing. For example, if you have an 8K expander plugged in and you reconfigure to "Unexpanded Vic+8K" it will show 5535 bytes free, but the user Ram will not start at 1024 because you do not have any Ram there.)

Try Running this program on an unexpanded Vic, and pressing number 6 — you will see what 28160 bytes free looks like. ■

RECONFIGURATION

```

1 REM RECONFIGURATION
2 REM BY P.E. WILSON
3 REM VIC-PET COMPUTER
4 REM CLUB GORBY.
5 POKE3&879, 27: CLR
20 PRINT " RECONFIGURATION"
30 PRINT " 1 UNEXPANDED VIC"
40 PRINT " 2 PLUS 3K"
50 PRINT " 3 PLUS 0K (8K+MEMORY)"
60 PRINT " 4 PLUS 8K"
70 PRINT " 5 PLUS 16K"
80 PRINT " 6 PLUS 24K"
90 PRINT " PRESS 1 TO 6"
100 GETA$: IF A$ < "1" OR A$ > "6" THEN 100
110 IF A$ = "1" THEN A = 14: B = 30: C = 30
120 IF A$ = "2" THEN A = 4: B = 30: C = 30
130 IF A$ = "3" THEN A = 16: B = 32: C = 16
140 IF A$ = "4" THEN A = 16: B = 64: C = 16
150 IF A$ = "5" THEN A = 16: B = 96: C = 16
160 IF A$ = "6" THEN A = 16: B = 128: C = 16
170 PRINT " LEAVE SUPER EXPANDER FUNCTIONS AVAILABLE?"
180 PRINT " Y OR N"
190 GETB$: IF B$ = "" THEN 190
200 IF B$ = "Y" THEN B = 41031: GOTO 220
210 IF B$ = "N" THEN B = 44924: SYS 44850: GOTO 220
215 GOTO 190
220 POKE&41, 0: POKE&42, A: POKE&43, 0: POKE&44, B: POKE&45, C: SYS 0
READY.

```

Designer complete

This is an extract from *Designer*, one of the programs in the chapter on graphics in *The Working Spectrum*, a book by David Lawrence, published by **Amstrad Books Ltd**, Hotham Road, 18 Watlington Street, London WC2J 7NP. £5.95, 208pp.

Testing Module 3.5.3

If this module is functioning correctly you should be able to RUN the program and initialise the variables. Having done this, stop the program and enter, in direct mode, 127:200 and 127:100 as values for X1/Y1 and X2/Y2. These four values should result, if you GOTO 1000, in the drawing of a line from the middle of the top edge of the screen to around the middle of the screen.

Module 3.5.4

The purpose of this module is to allow the user to move a small cursor around the screen in order to set the start and finish co-ordinates of a line.

Commentary

Line 1000. Though the program is capable of shrinking the overall design by any specified factor and rotating it, lines can only be input with the design at normal size and unrotated. This line sets the angle of the design (ANGLE) and the reduction factor (SF) accordingly, before calling up the module which draws the part of the design to which the user makes the screen point.

Line 1030. You may have noticed that the screen is only 100 pixels high, rather than the 176 permitted. This is to allow line 21 to be used to display the actual co-ordinates of the cursor in relation to the bottom left-hand corner of the overall design.

Line 1090. In the course of the program, two sets of variables are used at various points to store the same data, namely X1/Y1, X2/Y2, X3/Y3 and Y3/Y4. The simple reason for this is that at times the value of one co-ordinate is altered for some temporary purpose. The leading Y is an indicator that this is intended as a temporary storage place. This line also permits the user to move the variable pointed to by the screen after defining the beginning of a line. In this way lines may be defined which pass over more than one screen area.

Line 1030. Having drawn the specified line, the user is invited to confirm it or, otherwise, if it is confirmed, the co-ordinates X1/Y1 and X2/Y2 are stored in two byte form created by FN A5 and FN 03, in the undefined string A5.

Lines 1090-1170. You will recognise these as a fairly standard cursor moving routine. One difference is that apart from the cursor keys themselves, the keys immediately below them and to the right (YU1) can be used to move the pixel cursor 10 pixels at

a time, thus speeding up the process. Pressing J causes a return to an earlier part of the module, thus defining one of the sets of co-ordinates.

Testing Module 3.5.4

By entering a temporary line 1000 with Return and defining 01 and 02 in direct mode as 127 and 00 respectively, you should be able to call up this module and move the cursor around the screen, define two positions — you cannot yet move the screen in between the start and finish of the line — and see the line displayed for your confirmation or otherwise.

Module 3.5.5

If this is the module which allows the window represented by the screen to be moved around the design command.

Commentary

Line 1000. The position of the screen in relation to the design as a whole is defined by setting the position of the centre of the screen. Note also that when the program function is 2 only positions with positive co-ordinates are available to the user. That is, the user can only draw lines in parts of the design which have positive addresses.

This is because negative addresses cannot be stored in A5 by the two functions FN A5 and FN 03. At other times during the program's execution, such as when a design is rotated, lines may be created whose ends have negative co-ordinates and these will be printed without problems if the screen window is set to point to them.

Line 1040. The borders of the screen are set to match the specified centre of the screen.

Lines 1060-1080. Using the function FN A, the values stored in A5 are translated back into numerical co-ordinates. They are translated into positions relative to the centre of the screen window. This distance is then multiplied by the scaling factor. The co-ordinates are then added around the centre of the screen through the required angle.

Lines 1090-1030. The procedure for moving a point with co-ordinates X and Y through an angle, say A, is to apply the formula: X2 = X-COS A + Y-SIN A and

Y1 = -X-SIN A + Y-COS A.

Line 1040. The variable Search is used to indicate that the design module is to be called.

Testing Module 3.5.5

You should now be able to move the screen window over your design and also to move the screen in between the first and second set of co-ordinates when defining a line. You should also be able to print the overall design, or a part of it, at various scales and at various angles.

Module 3.5.6

This module draws the line pointed to by the loop variable I in the previous module. The line is drawn twice with OVER set and the user is then given an opportunity to specify either that the line remains or that the program leaves the module or that the address of the relevant line is removed from A5. The line is flashed until one of these inputs is made.

Testing Module 3.5.6

You should now be able to delete lines.

Summary

This program is a useful tool in a variety of applications, given a little imagination. You can plan layouts, draw maps or simple nets about. In fact you can simulate many of the capabilities of more expensive graphics computers beloved of engineers and scientists in many fields.

But do not forget that the program is also an example of an easily accessible technique applied to the Spectrum. The books are there for all of us, crammed with powerful ideas that help release the power of your mind.

Going Further

1) Could you combine this program with the techniques of shape drawing found in the Targem program, allowing the start address of certain common shapes to be specified in A5?

2) The program would be more flexible if it made provision to print out text as part of the overall design. Once again the co-ordinates would need to be stored in A5. ■

Module 3.5.4

```
1000 GOSUB 10000:PRINT " "
1010 GOSUB 10000
1020 GOSUB 10000:PRINT " "
1030 LET P=0:GOTO 1040:DO UNTIL P=1
1040 GOTO 1050
1050 PRINT AT 20,10:"X1/Y1: "
1060 LET X1=0:GOTO 1070
1070 GOTO 1080
1080 GOTO 1090
1090 GOTO 1100
1100 GOTO 1110
1110 GOTO 1120
1120 GOTO 1130
1130 GOTO 1140
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Man made

Keith and Steven Brain
explain how to add graphics
to your own Oregon games.

In our last article, we looked at reaction testing and saw how a very simple idea became much more complicated as random factors and on-screen scoring were introduced. However, even at the end we were still only looking for the numbers one and two, which is not exactly mind-blowing Good games always have a story attached to them, so what about converting that decision column to a real score?

It is always a good idea to include the instructions in the title sequence (line 10). The `Play` command in line 20 is a useful way of causing the program to pause while the instructions are displayed.

Abstract

Let us consider how to make a low-resolution picture of a man, using characters 128 to 143, which consist of black and green blocks in varying arrangements. A black background is necessary, so we must change the default `cls` command (present in `CH03.BLOCK`).

The best way to design your figure is to use required input values for ordinary parameters and only plot the results of the calculations. In many cases, the results are displayed in 2 or 3 blocks. You can then work out which characters these correspond to — referring to Appendix A of the *Chaos manual* if necessary — and put those numbers into a grid. If the number required is 129 you will have to find an alternative, as that is the same as the background colour and hence not on the screen. For our example, the grid is 3×4 and consists of the following characters:

[illegible]

Graphics characters on the Dragon cannot be called directly from the keyboard and must be accessed via the CHR function. To avoid altering our original program any more than necessary, we will put the new part in a subroutine at line 1030. To identify the top part of our map at a particular position, we need to:

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The second type of character needs to be one bit (32 characters) below this although, as the first character is 128, it is simpler to ignore it and say:
use characters 64-127 instead.

Abstract: The purpose of this study was to determine the effect of a 12-week training program on the physical fitness and health-related quality of life (HRQL) of sedentary, middle-aged women. The study was a randomized, controlled trial. The subjects were randomly assigned to either a 12-week training program or a control group. The training program consisted of three sessions per week, each lasting 45 minutes. The control group did not participate in any training. The subjects were assessed at baseline and at 12 weeks. The primary outcome was the change in HRQL. The secondary outcomes were the change in physical fitness and the change in body composition. The results showed that the training program had a significant positive effect on HRQL, physical fitness, and body composition. The control group showed no significant changes. The findings suggest that a 12-week training program can improve the physical fitness and HRQL of sedentary, middle-aged women.

1000

Model	Peak Time (s)	Area (a.u.)	Intensity (a.u.)	FWHM (s)
Model 1	1.00	1.00	1.00	1.00
Model 2	1.00	1.00	1.00	1.00

You can check what the figure looks like, and that you have entered the lines correctly, by trying date 1000. Finally, we must not forget to add a *Ploton* from the *Authors class*.

The next problem is working out where on the screen the figure can appear, if it is not to find himself blown to pieces as the screen wraps round! We will restrict him to moving horizontally near the center of the screen, and prevent wrap-around, by including `if (x>400) x=255` in line 110. This forces the figure to be drawn in one of the 30 positions following position 255 (i.e. on line 5).

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One of the great problems in combat is recognising your enemy and shooting him quickly without also blowing your mates' heads off. So, we will substitute different coloured figures for the numbers one and two, with the green man representing our allies and the yellow one the enemy.

The yellow and black blocks required each have a character code that is 10% higher than the corresponding green and black block, so this number must be added

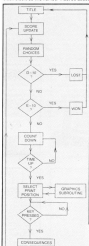


FIGURE 1. **Stochastic Process Simulation**



Fig. 2. Constructing the paths of a man from his own characters.

FULL PROGRAM LISTING

```

5 REM FIRING LINE COPYRIGHT K & S BRAIN 138283
10 REM TITLE & INSTRUCTIONS
20 CLS3:PRINT$171,"FIRING LINE":PRINT$257,"PRESS
ANY KEY TO FIRE AT YOUR":PRINT$252,"ENEMY - THE
YELLOW PERIL":PRINT$385,"BUT BE SURE NOT TO
SHOOT YOUR":PRINT$423,"GREEN-COLORED HATES!":
30 PLAY"TS8ACGACGACGACGACGACGACGACGACGACGACGAC
GACGACGACGACGACGACGACGACGACGAC"
40 REM SCREEN UPDATE
50 CLS0:PRINT$31,"":FORN=0TO 4:PRINT$P*(145):
NEXT:PRINT$31,CHR$(128):PRINT$448,"":FORN=1TO
(16-0):PRINT$P*(133):NEXT
60 REM RANDOM TIME AND GRAPHIC COLOUR - CHECK FOR
END OF GAME
70 A=INT(500*(C=0)/2):IFD=10THEN2010 ELSE IF
E=10THEN3010
80 REM INITIAL WAIT TIME COUNTDOWN
90 A=A-1:IFA>0THEN50
100 REM CHOOSE PRINT POSITION - GOTO TO GRAPHICS
SUBROUTINE
110 A=0:FORN=30+255:GOTO255,1:GOSUB1000
112 REM RANDOM NUMBER OF CHECKS FOR KEY PRESS
120 TIMER=0:FORN=1TO0:50+50:AN=INKEY$
122 REM CONSEQUENCES OF KEY PRESS
130 IFAN=""THENNEXT:IFC=2THEN SOUND15,10:
D=D+P*(1):GOTO50:ELSESOUND150,5:GOTO50
140 IFC=1THEN SOUND1,10:D=D+P*(1):GOTO50
1500 REM GRAPHICS SUBROUTINE - SELECT GREEN OR
YELLOW CHARACTERS
1610 SOUND200,5:D=D+1:T=(T+TIMER)/2:GOTO50
1620 IFC=2 THEN G=16 ELSE G=0
1630 PRINT$P,CHR$(129+G),CHR$(135+G),CHR$(131+G):
1640 PRINT$P+33,CHR$(133+G):
1650 PRINT$P+65,CHR$(142+G),CHR$(136+G):
1660 PRINT$P+97,CHR$(136+G),CHR$(136+G):RETURN
2000 REM YOU LOST
2010 CLS4:PRINT$41,"YOU JUST
LOST":PRINT$71,"YOUR LAST CONRADE":SOUND1,10
2020 PRINT$228,"BUT YOU KILLED":E,"ENEMY":
2030 PRINT$322,"YOUR AVERAGE ACCURATE
FIRING":PRINT$368,"TIME WAS":PRINT
USING"###,##",T:(SOUNDINT(T)),10
2040 FORN=255TO1STEP-5:SOUNDH,1:NEXT:RUN
3000 REM YOU WON
3010 CLS2:FORN=1TO255STEP5:SOUNDH,1:NEXT
3020 PRINT$35,"CONGRATULATIONS":PRINT$57,"YOU
DESTROYED THE ENEMY FORCE":
3030 PRINT$226,"YOU LOST":D,"OF YOUR MEN":
SOUND1,D+1:PRINT$250,"YOUR AVERAGE ACCURATE
FIRING":PRINT$326,"TIME WAS":PRINT
USING"###,##",T:(SOUNDINT(T)),100:RUN

```




GONE FISHING GONE AWAY

L.H. Thomas of Bridge Club, Hants, York, writes:

Q I recently bought a game called the 'Telling Home Entertainment Centre'. I have managed to buy about four games for it, but it now seems impossible to obtain any more. I did write to the manufacturers, but received my letter back marked 'game away', so I presume that the company has folded. In *Popular Computing Weekly* I read that the Games Centre in Oxford Street sells all sorts of computer games. Do you know if they stock them for my computer game? If not, do you have anyone who does?

A I went in and spoke to someone at the 'Games Centre'. Although they had heard of the Telling, they knew nothing about it — it was only a name to them. They do not, and never have, stocked games for it. Perhaps one of our readers can help?

CONSULT THE ORACLE

Melvin Clark of Manor Way, Aylesham, Surrey, writes:

Q I am 16 and at present am using a ZX81. I wish to progress to an Orion-1, as mentioned in your issue 26, but I am unclear on a few points:

- a) Will Ports be available on just the 48K version?
- b) How much Ram will be available to the user on the 16K machine?
- c) How many user definable graphics will there be, and will the character set include lower-case characters?
- d) What will the tape transfer rate be?

A Ports will only be available on the 48K version. The amount of user Ram de-

pends on whether you are in high-res, or normal mode. If you are in normal mode, then you will have to use the Ctrl command to access the full-screen of the screen space otherwise reserved for high-res. This is not as complicated as it sounds. In high-res there should be about 9K available to the user.

The tape transfer rate will be either 200 baud, or 300 baud if you want to take extra care against corruption. The whole character set is re-definable on the Orion. For further details, see our review of the Orion in *Popular Computing Weekly*, January 15.

A LIGHTER SHADE OF PALE

Kent Wilson of Yardhurst Gardens, Margate, Kent, writes:

Q Can you give me details of how a light pen works, specifically for the BBC machine? Are there several different kinds? How easy would it be to make a light pen, assuming that the analogue interface was already installed?

A Basically, a light pen uses a photo transistor to measure the changes of resistance caused by light between a collector and emitter. You will need to use a BBC. If machine, because the A does not have the necessary penlink port.

The pen will read whether a dot is colour, or black and white. There is a special register in the 6845 chip to control it. This register is accessible from Basic.

You should have no problems in firing a light pen, if you already have an analogue-to-digital converter. If not, there is a circuit diagram and all the necessary instructions in Stephen Adams's book *20 Electronic Projects* available from Interface.

WHOSE FAULT IS IT ANYWAY?

David Whitcomb of Power Road, Grange 6206, South Africa, writes:

Q I have been considering buying a ZX Spectrum and would like to know about the faults in the Ram. Are the later Roms improved or will an updated Rom be brought out by Sinclair?

What advantages does the Atari 800 have over the 400? Can the 400 be updated to include the features found in the 800?

A The faults in the Spectrum Roms are not immediately noticeable to the average user. As long as the user stays in Basic there will be little interference. The only two faults are that *Speedy* cannot be conserved, and that if you hold a key down on a keyboard, the cursor will not change and the keyboard will be repeated.

Most errors will only affect machine code programs. There is also a section of redundant ZX81 code in the Rom. The best place to look for details of these is in Ian Logan's book *Understanding Your Spectrum* published by Melbourne House.

The Atari 800 features a full keyboard, unlike the membrane on the 400. It also has a composite video output, so enable it to be used with either a colour or black and white monitor. The Atari 400 is, strictly speaking, limited to 16K. A 48K memory expansion is available from Maplin, although this costs the Atari guarantee.

MACHINE CODE WANTED

William Gupta of Howdown, Huddersfield, writes:

Q I have a Vic20 and would like to know who is now active in publishing machine code programs for it. Including you. Are they particularly difficult to write? Could you please publish one for the unexpanded Vic — you

publish them for the Spectrum and the ZX81.

A Also, I would like to know why the memory addition for the Vic is so much more expensive than for the Spectrum. I have been told that both the Vic and the ZX81 use the same memory chips. Is that true?

A Machine code for the Vic is a subject that does come up from time to time. We can only publish what we are sent, and no one seems to be writing machine code programs, other than the commercial software houses. Perhaps this is partly due to the fact that the necessary information is not as readily available to Vic owners as it is to ZX owners — namely the number of banks an machine code and decompressing the Spectrum Rom.

As for memory, a manufacturer will charge what he thinks he can get for the product. It is not that memory chips for the Vic are particularly expensive, it is just that the ZX market is so competitive that prices have been forced down.

The price of Ram has dropped considerably since the original memory expansions were brought out. Sinclair was forced to drop the price of its 16K Ram pack, for the ZX81, because other manufacturers were producing the same memory for half the price. This has not happened with other computers.

The Vic uses 2114s — the same as the ZX81, only the access time is different. Those on the Vic are faster, under 200 nanoseconds, and can be bought for about 11 each from component suppliers.

Is there anything about your computer you don't understand, and which everyone else seems to take for granted? Whatever your problem PEEK & POKE Beadmore and every week he will PEEK back as many answers as he can. The address is PEEK & POKE, PCW, Hothouse Court, 19 Whitcomb Street, London WC2E 7HF.

Top 10

Books

- 1 *Enter the Dragon: Computer Languages and Programming for the BBC Micro*, Beadmore
- 2 *How to Write a Program in BASIC*, L. J. L. Jones
- 3 *Computer Hardware*, various authors
- 4 *Computer Hardware*, L. J. L. Jones
- 5 *Computer Hardware*, L. J. L. Jones
- 6 *Computer Hardware*, L. J. L. Jones
- 7 *Computer Hardware*, L. J. L. Jones
- 8 *Computer Hardware*, L. J. L. Jones
- 9 *Computer Hardware*, L. J. L. Jones
- 10 *Computer Hardware*, L. J. L. Jones

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Say what you mean

The problem of the meaningfulness of program text — in the case of BASIC or any other language — is a key way into the limitations of artificial intelligence.

There are two principal aspects: What does the perfectly legal code mean and — can we find a way to always decide what it means, if necessary?

Q. Moreover, Rabinson (*Pittsburgh's Post-Gazette*, 1969) posed three more questions for intelligence tests: "...high marks are gained by those who subsequently prove to be practically illiterate. So much time has been spent in studying the art of being tested, that the candidate rarely has time for anything else." Rabinson was stressing that, though the candidate might be able to define the meaning of a question in any intelligence test and had learned the rules for its doing, this did not mean that he would be able to establish or convey meanings outside the narrow framework of the tests.

Though not always true, generally speaking a

5000. If $\mathbf{A} = \begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}$ and $\mathbf{B} = \begin{bmatrix} 4 & 3 \\ 2 & 1 \end{bmatrix}$, is not as it would appear at first sight. You might expect, given general rules about if statements, and the use of colons to distinguish statements, that if \mathbf{A} and \mathbf{B} were not equal their control would pass to the statement which contained the `For` command. This does not often happen.

What usually happens is that the first command (and any other statements on that line) is ignored. Why?—a conflict in definitions: in an `if` statement, `condition` moves to the first line; this is not treated as equivalent to control moving to

The statement after the colon reflects the hypothesis that the color red is associated with the word "love".

I would guess that when this ambiguity was first discovered it had not been foreseen. As with many aspects of programming, things crop up which have not been predicted and whose meaning is obscure — but which are not illegal.

The decision to proceed with the standard way of interpreting the meaning (to ignore any other statements on the same line, if the *if* is false) is not based on the existence of some clear and unambiguous interpretation of the meaning; it happens because that is the way the programmer expects.

[illegible]

It is more pretentious language (Pascal) and still come across problems. The one from last week:

DOI: 10.1002/for

which is a composite of two. If there are state-ments, to which it does the Else refer? The usual solution (from the translator) is to make the Else refer to the second. If the subject of much debate (called the "dangling" Else in computer science), it shows that even for a more up-market language there are as many problems.

In anything as complex as a computing machine it is impossible to predict all possible contingencies (there can be no universal decision procedure) and this accounts for many "bugs", and the many unknown and undocumented features which appear with use.

The designer of a computer never tests it until it can't possibly die.

**The square
root of PCW**

[illegible]

Here is what is called an *Alphabetic*, in which letters of the Latin alphabet substituted for the digits 1 to 9 (zero is not used):

√ SQUARE = PCW

It is obvious that every square has a square root, but can you find the number that $\sqrt{2}$ stands for? Careful, though — there may be more than one possible answer!

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The maximum value for each digit, when cubed, is 729 (9^3). So, for 2, 3 or 4 digit numbers the maximum sums of cubes are 1458, 2187, and 2916, respectively. However, with five digits the maximum possible sum is only 3645 (9×9^3) — less than five times.

Therefore, numbers of five or more digits are not possible. Clearly, as the four digit total can only equal a maximum of 2940 we can, by continuing the process of reasoning, reduce the range of numbers to be tested to those under 2940.

```

60  FLOOR M := F TO LEAST M
61  LET N0 := (FLOOR M)
62  LET T := 0
63  WHILE M - N0 > 0 DO LEAST M
64  LET T := T + ((N0 - FLOOR M0) * FLOOR M0) + ((N0 - FLOOR M0) * FLOOR M0)
65  NEXT M
66  IF T = 0 THEN PRINT M
67  NEXT N

```

By running the program it can be seen that there are only four numbers with this property:

2003	1	1	1	1	1	1	1
2004	1	1	1	1	1	1	1
2005	1	1	1	1	1	1	1
2006	1	1	1	1	1	1	1

It is interesting to try to do the same sort of calculation for four-digit numbers giving: 1634, 8208 and 9474.

McIntyre and Cummings 2002

The authors of *Florida Bay II* by George McGowan, Linda Anderson, Barbara Laska, and the authors of *FLS*.

Top 10

[illegible]

LOSES
POUNDS
IN THE
TOWER

What manner
of friendship
spell has been
cast on my
lady...

To avoid
getting in
hot water,
do not attempt
to cast spells on
the lady of the
manor.

Coverly

